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ABSTRACT

Quality in distance education and open learning is the theme of this collection of five papers. The first is a compilation of outlines of Charles Sturt University (New South Wales, Australia) innovative teaching projects contributed by project leaders or team members. Quality initiatives are described in a range of disciplines. In seeking to promote quality assurance, distance institutions often attach considerable importance to student survey responses, as the student is the consumer of the product, distance education. Thus, the second paper examines a series of fallacies associated particularly with the use of printed questionnaires to evaluate distance subjects. The way in which students use the distance education study materials is the subject of papers three and four. The first of these involves a survey of two student groups regarding their use of intext activities, and a literature review allows discussion of general trends in student use of these materials. The second of the materials-use papers examines student interactivity with study materials, lecturers, and each other. The effectiveness of the interactivity and some recommendations for future action are included. The final paper gives a description of the way in which the Royal Australian Airforce redefined aircraft trade training from face-to-face teaching to predominantly distance mode. (Contains 25 references.) (Author/MAS)

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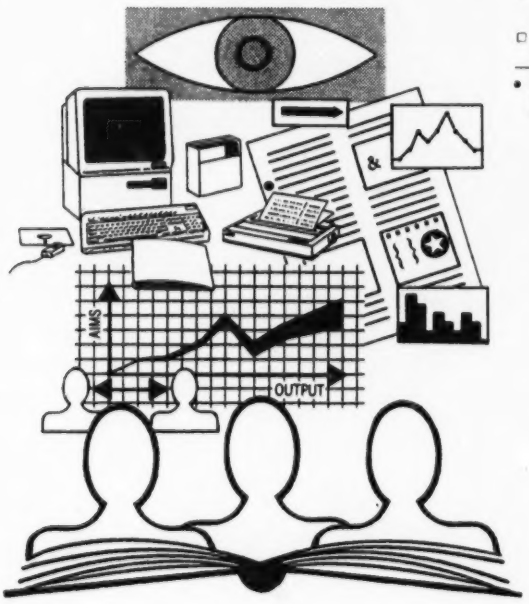

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Editorial comment

This issue of *Occasional Papers in Open and Distance Learning* contains five papers that in one way or another touch upon the theme of quality in distance education and open learning.

The first paper is a compilation of outlines of CSU innovative teaching projects contributed by project leaders or team members. Quality initiatives are described in a range of disciplines and the paper may hopefully inspire some readers to submit applications for teaching development projects in their own specialisms. Occasional paper 1/94, *Finding funds to develop teaching*, published in February by the Educational Development Unit, examines issues of funding for teaching developments and includes a summary list of all previous CSU grants, including funding details of most of the projects discussed in this paper.

In seeking to promote quality assurance, distance institutions often attach considerable importance to student survey responses because in quality parlance they are the 'consumers of the product'. The second paper by Roger Cresswell critically examines a series of fallacies associated particularly with the use of printed questionnaires to evaluate distance subjects; it cautions against data too easily reduced to statistical representation; and it advocates a closer relationship between authors, presenters and evaluators of distance education course materials.

The way in which students use the Distance Education study materials is the subject of papers three and four. Anne McDonald surveyed two groups of students regarding their use of intext activities. Particular activities from subjects currently under study were targeted and students at the Residential School were given the opportunity to comment on the way they approached the specific activity. A literature review allows discussion of general trends in student use of intext activities.

Interactivity is the topic which Jill Harris examines in her paper. Within a particular cohort of students she examines student interactivity with study materials, lecturers and each other. The subject was the first in a new degree course and was designed to encourage interactivity. The effectiveness of the interactivity and some recommendations for future action are included.

The final paper in this edition gives a description of the way in which a large Australian organisation, (the RAAF) re-defined aircraft trade training from face-to-face teaching to predominantly distance mode. Eric Holgate was involved in the changes and the development and instructional design of the distance teaching materials.

Peter Donnan
Anne McDonald

Editors

A call for papers

Occasional Papers in Open and Distance Learning is published in April and November of every year, and exists as a forum for discussion. As the title suggests, a variety of issues are appropriate for discussion on the pages of *Occasional Papers.*

The editors would like to invite papers from CSU staff which focus on open learning and distance education. Quality issues and technological change are both issues of immediate interest in this area, but *Occasional Papers* would not be limited to those themes.

Please submit a copy of any material for publication in the next issue to:

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Innovations in teaching

P. Donnan, R. Kerr, V. Clark, L. Ballantyne
N. Klomp, H. Geissinger, S. Black.

Introduction

Peter Donnan

At Charles Sturt University there are many outstanding distance education subjects based on the traditional model of print based learning materials, possibly supported by a residential school. As part of the national quality agenda in recent years, however, academic staff may now submit applications through a range of schemes to support improvements and innovations in teaching. The Educational Enhancement Fund established at CSU in 1991, the National Priority Reserve Fund (NPRF) and the Committee for Advancement of University Teaching (CAUT) all support a wide range of teaching grants.

What type of applications meet with success? How is the workload of teaching staff influenced by a successful grant application? Are there particular theories of teaching/learning associated with successful grants? Given the fact that 90% of the first two rounds of CAUT grants, worth about $9 million, involved some form of technology, should academics equate quality in their disciplines with rapid embrace of the new technologies? What are the advantages of the new technologies? Finally, in implementing successful innovations what links should academic staff establish with experts outside the university; furthermore, within the university in interdisciplinary terms, in what ways should academic staff interact with technologists and programmers, and OLI personnel such as instructional designers and video producers?

Responses to some of these questions are suggested in the outlines of successful CSU projects presented on the following pages but a number of themes and issues invite special comment.

Ron Kerr's account of an innovative project employing professional actors to enhance the development of nursing skills certainly illustrates that technology is not always the answer. Of special interest in his outline was how the teaching innovation led to reflection and questioning of previous approaches to teaching the clinical skills of bathing a patient in bed.

Val Clark and Lesley Ballantyne describe the versatility of educational videos in different disciplines and both writers indicate how these videos can become valuable residential school resources; having viewed the video beforehand students are better prepared for particular teaching sessions and this allows a sharper focus on particular issues and processes in the residential school sessions.

Nicholas Klomp's project which involved the purchase of a film recorder and required software to produce computer generated images, maps and models will be of interest to academics on all campuses who are interested in enhancing the professionalism of their teaching materials and educational presentations.

In identifying seven characteristics of expert performance, Glaser and Chi (1988) mention that experts: excel in their particular domains; perceive large meaningful patterns within these domains; solve problems quickly with little error; exhibit superior short and long-term memory; conceptualise problems at deep, structural levels; spend considerable time analysing a problem qualitatively and demonstrate strong self-monitoring skills. The simulated data environment of *This is Erewonga* is designed to promote such learning and the project team recognises that 'effective practitioners in any professional are characterised by their ability to see issues in context and envision workable solutions'.

The final two projects, *Stute* and the hypermedia resource to teach Grape and Wine Production (WSC110), are attuned to the future trends in course delivery referred to in the *CSU Quality Portfolio - 1994*:

> ...present technology can facilitate a fundamental shift in course delivery, placing responsibility for learning much more in the hands of the learner and providing greater flexibility in learning style, in content selection, in the mode of assessment, and in the time and place of learning. (p. 4)

Stute, developed in hypertext form using Toolbook for Windows, can be installed on IBM compatible computers; the hypermedia resource to teach Grape and Wine Production takes advantage of many of the multimedia capabilities of CD-ROM technology and is delivered on a Macintosh platform.

Project 1: Professional actors used to enhance nursing skills development

Ron Kerr

Funded through a Teaching Development grant from the National Priority Reserve Fund

Project Description

The aim of this two phase project is to improve the overall quality of students' time spent in both the laboratory and real world settings.

Critics of the pre-service nursing education at university level contend that it is too theoretically based, that the students have inadequate clinical experience, and that much of what is taught is inconsistent with the 'real' world of nursing.

To date the two most common methods of teaching clinical skills to nursing students have been:

1. Simulation sessions where students learn and practise clinical skills within a university laboratory. These include audio-visual aids, interactive computer programs and clinical equipment set-ups with or without mannequins or students as 'pretend clients'.

2. Clinical practicums where students are sent to relevant clinical settings outside the university to learn and practise skills with real clients supervised by a clinical instructor.

Usually a combination of both methods is used.

Many educationalists such as Knowles (1990) and de Tornyay (1987) have identified the physical environment as a crucial element affecting the quality of student learning. With that in mind this project modified the two existing methods already outlined thereby adding a third method of teaching basic clinical skills: the problem of artificiality of the nursing laboratory setting can be significantly reduced by employing professional actors to play the client role. While the employment of professional actors is not a new idea in itself, this proposal goes further by comparing its effectiveness as a learning strategy with the two existing methods. Fourteen first year students volunteered to participate. It should be noted here that any number and level of students and skills could have been selected. The first skill chosen to be mastered was 'bathing a patient in bed'.

Development phase

Three clinical teachers all registered nurses, and four actors were employed. The use of the nursing laboratory at Charles Sturt University and clinical facilities at Wagga Wagga Base Hospital was negotiated.

The students were randomly divided into three groups; each group was supervised by a clinical teacher.

Group A went straight to a hospital setting, practised and learnt 'bathing a patient in bed' on real clients.

Group B, the control, used the nursing laboratory and were taught and practised the skill on a mannequin.

Group C were taught and practised the skill the same in the nursing laboratory using professional actors as clients. These 'clients' had been briefed on their fictitious personal backgrounds and nursing diagnoses.

Formal learning sessions could be as frequent and as long as each student desired in their assigned setting. The onus was on students to seek out and negotiate learning session appointments with their clinical teachers. Teachers were instructed to be as

accommodating as possible within the limits of the availability of resources such as, the actors, the nursing laboratory or clients needing a bed bath in hospital.

A Clinical Skills Assessment Test (CSAT), developed specifically for the Nurses' Registration Board and based on the principles of mastery learning, was used to determine whether the clinical skill had been acquired by the student. Information recorded for each participant included the number and the duration of practice sessions, the date each student elected for assessment and the number of attempts at the assessment test as well as the date of skill mastery.

Educational benefits

The project confirmed that the validity for teaching this intimate type of nursing care can only be present when the student feels a strong sense of security, purpose and authenticity. It was thus expected that students learning using professional actors **(Group C)** would master the skill most quickly closely followed by those students learning with real clients **(Group A),** while those using mannequins or fellow students **(Group B)** being the last to master the skill and requiring a greater number of attempts at the assessment test before achieving success.

The rationale for these predictions was based on the assumptions that:

- Students learning with professional clients (i.e. paid actors) would feel comparative higher levels of security, authenticity and purpose.
- Anxiety levels in learning a new skill on a sick client in hospital would contribute to students sense of insecurity. Other parameters, however, such as authenticity and a sense of purpose would be at their highest level.
- A mannequin (or fellow student) as a client may offer learners higher levels of security but the lowest levels of authenticity and sense of purpose compared to the other two learning environments

An anonymous questionnaire was distributed to the thirteen volunteers after phase one. The fourteenth student had withdrawn from the nursing course. Six completed surveys representing just under a 50% response rate. All respondents claimed to have learned a clinical skill as a consequence of this project.

When asked what they had learnt from involvement in the project three of the six focused on the selected skill 'bathing a patient in bed'. The remaining three mentioned broader outcomes such as:

> *'Learning a skill in a hospital setting makes you learn more quickly, but is a lot more successful'.*
>
> *'Interaction with the client, working with other nurses [you] look for signs that are not obvious, mental health of client'.*

'I was able to increase the knowledge I had gained in my first semester. I also realised the importance of continuing education for all health professionals'.

Students' preference for a realistic learning environment is obvious from their following comments:

'Clients were real, they talked back and responded when necessary. Their problems were also real'.

'A person makes you feel like you are giving the help they need, the atmosphere increases confidence, it's real, not false like a mannequin. Better experience with a real person. You are able to notice other things such as mental status'.

'Learnt the set-up of the ward in terms of doing a sponge bath. Had actual patient response. Also liked the idea of learning how to change how you have a sponge bath in terms of the client's wound/injury'.

'The actor was good as it was a real person - you cannot learn properly with a mannequin - they hardly resemble a person in a real life situation. The actor was good as you could learn to deal with embarrassment, they could tell you if you were causing them discomfort - although they were not really ill it was a bit more of a realistic scenario'.

'Although actors are excellent for understanding patient needs, they are not patients. To be an effective nurse I believe that it must be established that all patients are individuals, and by using actors instead of mannequins this is achieved'.

'Being thrown straight onto a patient was quite stressful and nerve wrecking. (One is far more relaxed in the uni environment)'.

'The fact that if I made a mistake it could actually hurt someone'.

'Mannequins are not real, so much difference in the laboratory, I feel we don't do a good enough job because we know they're not real. A person makes you do the job correctly'.

Summary of results

1. Students who learnt and practised 'bathing a patient in bed' using a mannequin in the nursing laboratory (the control group) were the least committed to learning this clinical skill. They sought the least teaching yet were the first to elect for assessment. They were also the first to withdraw from the learning program due to other commitments perceived to have higher priority. None mastered the skill nor responded to the survey.

2. Students who learnt and practised bathing a real patient in hospital all mastered that skill. Three out of five required multiple attempts. Learning on real patients in hospital is stressful, these students sought the most teaching.

3. Students who learnt and practised bathing a patient in bed using a paid actor mastered that skill on their first attempt. They learnt the skill most quickly.

4. Students prefer to learn in an environment where there is a strong sense of security, purpose and authenticity.

The results of phase one suggest a need for a revision of how we currently use the nursing laboratory. Adelman (1984) has discussed the ethical issues involved in continuing with a particular learning strategy if it has been clearly demonstrated that it is an inferior one. This project casts serious doubts on the sole use of the mannequin scenario as an effective method for learning to bath a patient in bed.

Phase two is currently under way and will form the basis of a future report.

Project 2: An educational video in social work

V. Clark

***Course team and acknowledgements*:** Margaret Alston, Bill Anscombe, Wendy Bowles, Janusz Darecki, Russel Hurley, Anne McDonald and Jenny McKinnon. Also to Carmel Flaskas, lecturer in Social Work at UNSW.

Project description

A teaching development grant was used to fund the making of an educational video for use in the CSU Social Work course. The final product, *Systemic Family Therapy in Social Work Practice,* is a 43 minute video which is accompanied by a 27 page manual.

The video shows the application of a theoretical framework to a particular social work practice situation. The case situation involves a rural farming family who request help with family relationship problems.

The manual provides additional notes, exercises for students to complete as they work through the video, an edited transcript of the parts of the family interview which are not shown on the video and a short reference list.

Development phase

Initial planning and consultation

This phase involved consulting with teaching staff, an instructional designer and an audio visual producer at CSU. A literature search was conducted and Social Work schools in other Universities were consulted. Basically this phase was about determining what the finished product should look like and ensuring we were making the most informed decisions. This phase was also important in setting up the project

as a team effort. We had a lot to learn about making a video and Anne McDonald's help in running a mini workshop for us was invaluable at this time.

Evolving the script and pre filming

This phase involved writing numerous drafts, consulting and redrafting. All the specifics of the plan became clearer, decisions were made about actors, timing venues, etc.

Filming and editing

In many ways this was the simplest part of the whole project. Because we had put so much careful thought into the earlier phases, we knew what we were doing and it went fairly smoothly.

Writing the manual

Apart from the actual writing this phase also involved circulation of drafts, rewriting, editing and layout design.

Integration into the social work subject

This phase involved organising for the video and manual to be sent to students as part of their mail package. Additional information was also included in the subject outline to provide students with guidelines on how and where to include the video in their study timetable. An assignment topic was based on the material presented in the video. Finally, the video material was included in the teaching program for the Autumn residential school.

Educational benefits

The video project has focused attention on the importance of providing students with demonstrations of social work skills in practice. This is particularly important in the CSU course which is the first social work course in Australia to be taught by distance education. We want to ensure that our students are not disadvantaged in comparison with their peers in other universities. The video is an innovation in this regard because, although teaching staff can demonstrate particular skills during a residential school, students cannot come back the following week and ask for a repeat performance. By providing a video our students may even have an advantage: they can replay the demonstration as often as they wish in order to grasp the finer details. In this regard it seems that the video complements well the usual mail package resources of study guide and readings.

The video has impacted significantly on residential school teaching. Students are better prepared before they arrive on campus and less time needs to be spent in demonstration. More time can be devoted to critical discussion of the video demonstration and on students developing skills through experimental exercises.

The findings of a survey of the first 42 students to use the video support our enthusiasm for this project. They valued seeing the process of a social work interview and found the additional material in the manual helpful. They also appreciated that the video is technically superior to the other demonstration videos currently available in this subject area.

The students were not blind to our mistakes, however, and we have benefited from their feedback on how to improve next time round. One of the most important lessons is not to use teaching staff to role-play clients. Students were confused when they met two of their lecturers for the first time at a residential school and discovered that they were actually very different people to the married couple they role-played on the video.

Project 3: Educational videos to support the teaching of Botany and Principles of microbiology

Dr L. Ballantyne

Project description

A sequence of videos illustrating important theoretical concepts and practical features has been prepared to span first year teaching of biology and all courses in the School of Agriculture. These consist of:

1. A 2 hour video comprising 12 individual segments (for Autumn session Botany BIO 126) which illustrates microscope use and many concepts normally taught under the microscope and incorporates tutorials on certain difficult topics.

2. In Spring session for Principles of Microbiology (BIO121), a 24 minute video which has four segments illustrating introductory concepts. Both videos are wholly incorporated into the distance education mail package and viewing of individual segments is timetabled.

In certain scientific disciplines it is difficult to separate theoretical (taught in lectures) and practical concepts (taught in laboratory classes). Laboratory classes in both these subjects function to illustrate theory as much as to introduce experimental procedure in each discipline. The video medium is proving to be an ideal mechanism that allows us to combine the two in an attractive teaching package.

Development phase

Botany (BIO126) is often the first residential school students encounter after no prior study, and thus the whole teaching process in this subject has been modified to help the transition process. The Botany video, an integral part of this process, accompanies a revision of the mail package materials and will be completely integrated into the package for 1995. It presents an introduction to microscope use, and concepts in plant anatomy, cell division, cell structure, and secondary growth normally seen under the microscope at Residential School. It also incorporates novel 'tutorial' sessions on mitosis (cell division) and secondary growth using common place items like plasticene and lego blocks. It uses microscope shots of dead and living material, is amply supplemented by line diagrams many of which incorporate successive build up of coloured segments, and shots of classroom activities and face-to-face segments with the lecturer. Directions are given throughout (e.g. 'at the end of this segment you should label all parts on these figures') so students know just what is expected of them, and what remains to be done at Residential School. It does not replace the Residential School but should prepare students much better for what they are to see there, and overcome some of our ongoing problems with introducing microscope use.

Parts of the Botany video were trialled during the 1994 Autumn residential school, and students freely volunteered their approval of the content and intent. Mr Hurley and I are putting together a 5 minute 'preview' to be shown to staff here as well as to this group of students when they come to class in September, so they can see progress on a project in which they have been involved.

The Microbiology video was first prepared in autumn 1993 for use that Spring. It was accompanied in 1993 by a separate manual, but has been further modified so it is now wholly integrated into the existing teaching package. In this subject, in particular, theoretical concepts are often best illustrated by performing practical procedures, and this video illustrates in a user friendly manner many basic topics and helps to defuse the apprehension many students feel about facing an applied and seemingly complex subject.

One of these projects was among the first to be funded under this scheme, and OLI personnel and those of us who were making videos essentially learned as we went, often uncovering areas of concern which had not been addressed in advance. The situation now has improved markedly for those who follow.

The exercise may be extremely time consuming. It is possible for this to be a relatively short process if one wishes to illustrate a well defined and focused area, which already exists in the teaching process. Both these exercises involved many separate segments, each an independent teaching exercise within its subject area.

The Microbiology video produced under Mr Darecki, developed from existing materials, was scripted and had a long and detailed shooting schedule. Classifying these shots (e.g. are these all microscope shots, do these involve people and action) made the shooting process much easier as similar shots were done together. Voice over was laid down first. Over 200 'scenes' most involving people and equipment use were rehearsed and shot, often more than once. Shots were timed by reading the

script as the action unfolded. The entire process including preparation of a manual and a week's editing at the end took six weeks. Having both typed script and shooting schedule proved an excellent way of keeping track of progress. Further work this year saw segments from the 1993 version of the Microbiology video incorporated into Botany, and editing done to reduce the Microbiology video to 24 minutes, appropriate now that the introductory material was being dealt with in Botany.

Mail package development and video production for the Botany proceeded simultaneously. Microscope shots were done twice as we realised the better resolution of the camera in the Morell labs; all were taken for at least 15 seconds, and often I voiced an approximation of what the script would be to give us an idea of shot length. Materials were often illustrated as line figures sometimes with action with pointer and/or colours. I was supplied with our rough 'takes' to view in my own time at home and was able to organise sequence and length, and finally in the assembled version I developed a definitive version of the script to suit the length of the shot (voice over was laid down last). I did not develop a structured shooting and script framework for this video, mainly because most of the shots were taken down the microscope, and because I knew from my teaching in the subject over 10 years just how I wanted to illustrate the topics. We trialled shots with the external class in autumn 1994, and staff. As the mail package developed so too did the video with the incorporation of the tutorial sessions.

I entered the phase of video making in Spring 1992 when costing for all mail package materials was borne by OLI. By 1993 the cost was to be borne by the schools. Consequently any such initiative has to be carefully evaluated in terms of effectiveness before an extra cost is added to the mail packages, especially in large subjects as these are (175 half hour videos will cost the School of Agriculture approximately $700 and it may be an ongoing expenditure). OLI has not been particularly helpful in suggesting ways to offset costs, and in 1994 we trust in our students to return the video at Residential school. No decision has yet been made concerning the Botany video for 1995.

It appears that there are now recommendations from OLI that will allow us to coordinate video production and mail package revision, which has not to this stage been easy. The expertise being developed (often as a result of some of these initiatives discussed here) is not as freely available as it might be.

Educational benefits

Although our expectations are well defined, we have yet to evaluate the educational benefits. Certainly much thought and development has gone into the complete integration of an extensive video into the teaching process in Botany, and the mail package and the whole teaching process is already the better for it, some of the initiatives already having been trialled. Video use in both subjects externally will be reviewed at the Residential schools, and the videos will be incorporated into the internal process as well, during lectures, practicals, and especially for missed classes, and for students who wish to revise material.

- ***Editor's note***

In 1994 more than 20 educational videos have been produced at CSU.

Early adopters of technology often encounter and expose difficulties that are resolved as production increases. The challenge to University quality processes is to respond to individual experiences and criticisms and so refine the system. Recent OLI initiatives in this area include:

- *production of a demonstration video*
- *production of a booklet to guide academics interested in making an educational video*
- *purchase of new equipment.*

As the video producer and instructional designers are provided by the OLI, the costs involved are slight. Reproduction of a half hour video (at time of going to print) is $3.00.

Recent evaluations indicate a high level of satisfaction with OLI video production processes in 1994.

Project 4: Illustrating teaching materials with computer generated and computer manipulated images

Dr N. Klomp

Project Description

A National Teaching Development Grant (National Priority Reserve Fund) of $12,000 was allocated to this project in May 1993. The grant was spent on the purchase of the hardware and software required, although the project involved much more than a purchase of equipment. This project was designed to assist and inspire teaching staff to enhance teaching materials with the help of computer generated images. This report describes the installation and initial uses of the hardware and software purchased with this teaching grant.

Development phase

Purchase of film recorder and software

The majority of the teaching grant was used to purchase a film recorder from Buddle International Technologies Pty Ltd. A film recorder (or 'slide maker') is a device which can be connected to a personal computer to create colour slides (35 mm) from

any image on the computer screen. The film recorder doesn't actually take a photograph of the screen but works by creating a high-resolution image of the screen in front of a 35 mm camera fixed within the unit. This device was requested to enable staff and students to create high-quality images, 35mm slides and manipulated photographic images for use in conferences and workshops, lectures and tutorials, and in packages used for distance education and supplementary teaching.

The film recorder purchased is a *Lasergraphics Personal LFR*. It is fully compatible with *Windows 3.1* and the University's suite of personal computers. Within the range of personal film recorders on the market, this product was determined to be the best, and better value for money than its nearest competitor, and has similar specifications to machines costing twice as much.

Installation

The hardware and software were installed by technicians from Buddle International Technologies Pty Ltd. These people travelled from Sydney to deliver and install the equipment and to provide demonstrations and tutorials to interested staff on campus, as discussed later.

For this project to be successful, it was important to attract as many members of the teaching staff as possible to use the equipment to enhance their teaching materials. To ensure easy access to the equipment and the software, the School of Environmental and Information Sciences dedicated a high-quality personal computer to this project, quite apart from the PCs individual staff members have in their offices. The 'special use' computer was centrally located. It had to be a fast, powerful machine (486-33, 8Mb RAM, 200 Mb hard disc), with enhanced graphics, network landline and dedicated connection to the GIS laboratory for the down-loading of images. It also required a full-colour scanner for the input of photographs, artwork, maps, drawings or text.

Demonstration and tutorial

In a further effort to encourage the adoption of this technology by teaching staff, it was considered particularly important to 'teach the teachers' to use the equipment. To this end, all staff of the Murray Campus were invited to attend the demonstations and tutorials provided by the suppliers of the film recorder. Approximately twenty staff members attended the demonstration, and all were impressed with the capabilities of the hardware. The graphics software purchased (including the industry standard *Photoshop* and *Persuasion* packages) was also demonstrated, with tutorial advice and assistance on these products provided to interested staff and for specific teaching requirements.

At the beginning of the tutorial, some time was spent explaining the opportunities this hardware and software provided in enhancing teaching packages. However, such an introduction was not required, since most staff came to the tutorial with specific ideas of their own, for which they simply did not have the facilities to realise. It soon became obvious to all staff attending the demonstrations and tutorials that, with the PC Interface Software provided, the film recorder was very 'user friendly', so creating

a computer-enhanced image or a 35mm slide was not particularly difficult to master. The graphics software products purchased are all compatible with *Windows 3.1*. Together, these products allow a first-time user to create high quality images and manipulate slides within minutes; there is also enough power in the system to allow scanned images and GIS images to be manipulated by colour and/or design.

Any type of film can be loaded into the unit, eg. print film could be used to create impressive maps and images from the University's GIS facilities at a fraction of the cost of a printout from a colour printer. However, slide film is mostly used to produce lecture material or 'slide-tape' teaching packages. Efficient use of the facility will result in slides being prepared by individual staff for the price of film ($10 for 36 exposures) and processing ($8 for one-hour processing), or fifty cents per image. The School of Environmental and Information Sciences is prepared to create the slides for other schools on a cost recovery basis.

Educational benefits

The installation and demonstration of the film recorder and graphics software generated a great deal of discussion among the staff present. Most staff immediately recognised the obvious benefits of the equipment in the development of conference and workshop presentations (not only would the presentation look more professional, but the University would benefit if every slide by every academic or student carried the University's name and crest along the bottom). Also, the facility has allowed the production of high-quality teaching materials for campus-based students, particularly in cross-campus subjects when the same subject is presented by different teachers on different campuses (the task of creating multiple copies of slides for the dissemination of consistent teaching materials across different campuses can be easily completed with this film recorder).

However, the most exciting application in this project has been in the enhancement of resource-based teaching packages. Staff have developed packages which encourage independent learning, irrespective of the students' campus or mode of study. Such packages consist of computer-generated graphics in printed material, as well as high-quality slides of annotated photographs and images to complement other teaching approaches. To date, teaching staff in a total of eight subjects have used the hardware and software purchased in this project to create computer-generated images and 35 mm slides to enhance the teaching packages offered to their students.

Since the first demonstration of the facility and discussions of its use in enhancing teaching, many more lecturers have expressed an interest in the project. Many academics who were not present at the first tutorial have since been given individual assistance in using the equipment to enhance their teaching materials. The more lecturers that use the facility, the more are exposed to its capabilities. One aspect of the project that is still being developed is the production and use of high-quality slides of annotated photographs, diagrams, maps and models, complemented with an audio-tape and/or notes. For example, two academics are currently designing slide-tape packages to be used to complement their lectures and tutorials in specific subjects, not just to enhance their distance education packages. These slide-tape

packages will be made available in the libraries of the different CSU campuses, and could be used in OLI courses.

Project 5: *This is Erewonga:* A simulated environment for problem focused Distance Education in health information management

J. Hines, M. Cartwright, W. Gates,
H. Geissinger, D. Hatherly, D. Ritchie

Project description

Erewonga is an imaginary Health District that consists of two Local Government Areas containing the towns of Erewonga and Yondbe. The simulated District is presented to students in the form of video, audiotapes, maps, official reports, census data and computerised data bases of health services information. This simulation will be delivered by distance education.

Students are presented with problems and/or issues to address using the simulation. This use of the simulation mimics the work that a graduate from this program would actually do. The method of delivery supports the main educational objective of the Bachelor of Health Science (Information Management) course, namely the analysis of the health care service environment.

The simulation presents both 'hard' and 'soft' information. 'Hard' information is defined as statistical data and reports of events and activities. 'Soft' information is derived from the political, cultural and social environment within which issues arise and decisions are made. This 'soft' information is presented using a variety of media to simulate the local radio station, newspaper reports, interviews, conversations and public meetings.

Development phase

Fundamental to this project was the establishment of an interdisciplinary team to achieve an appropriate skills mix. Team members' expertise included clinical health care, health services management, instructional design, distance education and information science/ technology. This skills mix, coupled with a high level of motivation and willingness to share ideas, has been invaluable. The development of the simulation has required the team members to collaborate extensively, thus ensuring the integration of the various components.

We considered it important to distinguish our simulation from mere case study material. To achieve this the simulation has to be capable of accommodating individual student queries and investigations. Therefore it had to be multi-dimensional, coherent and believable.

Consultation with major players in the health care industry helped ensure the relevance of the issues chosen for presentation, the resources in the 'problem packages' and the contents of the data bases. This interaction with industry was largely achieved using teleconferences in which participants were encouraged to discuss current practical and theoretical issues. Tapes were made of the teleconferences and the team then analysed the content.

Initially, twenty megabytes of computerised raw data were purchased which formed the core around which the simulation was built. These raw data were stripped of all identifiers. They consisted of five years' worth of health service activity data and were ready to be used in the simulated health district.

Educational benefits

This project covers three subjects withi the Bachelor of Health Science (Information Management) course. The first subject is offered early in the course. The last two subjects form a capstone and involve the integration of skills and knowledge from other subjects.

Traditionally, simulations and problem-focussed learning have been used in face-to-face teaching situations. This approach is not often used in distance mode in Australia. Some difficulties in presenting simulations in distance education have included the costs of, and the time required to produce, the many components required for a believable multi-dimensional entity. The ability to produce a compact yet comprehensive learning package requires a great deal of teamwork and careful attention to the dovetailing of components. Close attention to instructional design issues was vital to offer learning experiences that were structured and sequenced appropriately for distance students' cognitive development. We have used part of the CAUT grant to provide time-release for initial development and production of the simulation. Additional 'problem packages' can be developed for this and other courses based on the framework of this original simulation.

Problem-focussed learning requires that students become more self-directed in their work. Thus the teacher becomes a facilitator rather than a source of content. The energies of the teacher are focused on the construction of a learning environment , which favours learner autonomy and provides students with the opportunity to concentrate on the process of their own learning rather than just the content.

In 'real life', problems are seldom, if ever, neatly packaged and unambiguous. Rather there are 'problem situations' which may have many potential solutions. The ability to identify, conceptualise, state and address problem situations requires an awareness of the social, political and cultural environment in which they are embedded. Effective practitioners in any profession are characterised by their ability to see issues in context and envision workable solutions. Using this approach, our students face a number of problems which must be appreciated in their context, just as in the professional world. We propose that this form of learning is well suited to the development of effective practitioners.

To provide rigour to what would otherwise seem mere 'common sense', we have introduced Checkland's 'Soft Systems Methodology' (1991) into the teaching. This Methodology provides students with a framework for their appreciation of the wider picture, e.g. the multiple perspectives from which the problem can be viewed.

Audio-visual materials are necessary for the simulation. The use of a variety of media for the simulation presentation and the requirement that students respond in a variety of media helps students build skills in acquiring and disseminating information in context. For example they must respond in 'real life' ways, such as making phone calls, writing memos or making presentations.

The CAUT funding made it possible to add value to the development of the audio-visuals by providing money for traineeships. Bachelor of Arts (Communication) students at Charles Sturt University were employed to undertake production and presentation responsibilities for video programs, simulated radio talk-back, interviews, voicemail messages and public meetings. In this way, the project provided valuable learning experiences for students in another discipline.

Electronic mail will be used to enable students to access current information regarding the simulation and communicate with the teachers and each other. This will promote effective communication. Group work can be conducted by E-mail. It is expected that this aspect of teaching will be further developed, including access to on-line CD-ROM library searching, as the technological resources of the University are augmented.

The information embedded in the simulation takes the place of lecture notes. The role of the teacher changes to that of facilitator. The student is provided with a video which outlines the use of problems in their learning and delineates the role of the facilitator. Thus students are encouraged to develop their own autonomy and self-directedness. The team hopes that this will lead to an interest in lifelong learning.

Project 6: *STute: Tutorials in soil science*

Project team: **Associate Professor S. Black, Dr P. Eberbach, M. Gooey**

STute is a computer aided learning package designed to assist teaching and learning in the first year subject Soil Science (PSC104). Distance students using the package receive three disks to be installed on an IBM compatible computer (the minimum being a 286 with 2 mb of RAM and 4.5 MB of hard disk space, a mouse, and Windows 3.0 or higher); full time students can use the program individually or in small teaching groups on the file server.

Development phase

The initial impetus for the project was based upon two considerations: the difficulty of students in understanding concepts such as soil structural stability and acidity which occur at a scale where the cause can not be seen - only the effects observed; and the volume of material that has to be presented to students during a teaching session.

Following the successful application for a NPRF grant, a programmer with background experience in soil science was employed in the research team. Surveys indicated that over 80% of students enrolled in this subject(approximately 200 students each session in both modes) had access to IBM compatible computers either at home or at work and a decision was made to develop an animated program using Toolbook for Windows.

The early development phase focused on how animation could be used to demonstrate complex processes occurring in soils. The properties of the clay fraction, crystalline layer silicates and the chemical composition of the major particle size fractions were some of the first topics treated.

The sections of the subject presented in *STute* were cross referenced to the Study Guide material so that students had a framework for clarifying the written material. The interface incorporated navigation buttons and hotwords were also used throughout the program. The cursor changes shape when the mouse pointer is directed at the hotword and further information is then presented. Sections of the program were trialled at the residential school, evaluations were conducted and refinements to the program were made. A manual was produced to guide students through the installation and use of the computer-aided learning material. The project team leader and programmer also presented seminars at the Riverina, Murray and Mitchell campuses demonstrating the package to interested members of staff.

Educational benefits

Two surveys have been conducted using students who completed the subject in 1992. The first survey was conducted when about 30% of the program was written. The objective was to assess the acceptability of the approach to students. The group included 62 respondents of whom 84% had immediate access to the hardware required to run the program. The remainder were able to get access to the equipment. Figure 1 shows the outstanding results in terms of acceptance by this sample of students. The ease of use, animation and aesthetics all scored very highly.

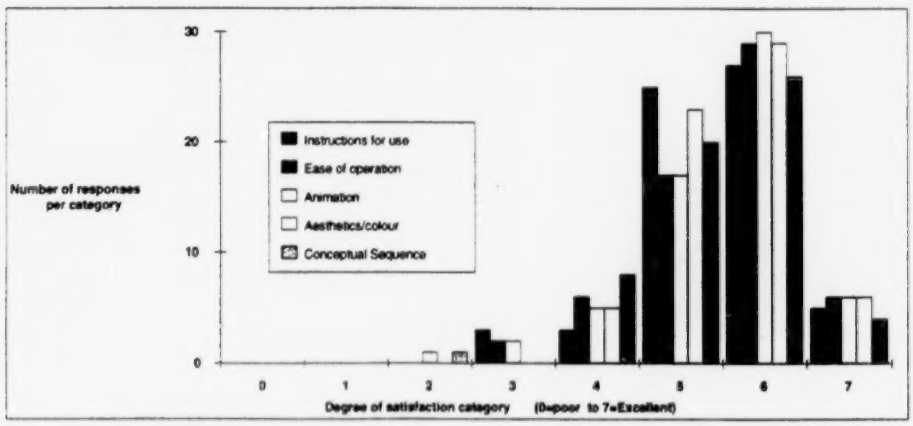

Figure 1: Results of a survey of a group of 62 students during 1992.

A second survey was conducted using a small group (13 students) to assess the ease of installation and ease of use. The results were very satisfying with typical comments being:

> *'I think the program is an excellent teaching tool and the topics on crystalline structure and water movement provide a three dimensional examination which is not possible from the Notes and textbook'*
>
> *'I think you have a good commodity here and one which is desperately needed, especially in such a subject as soil science which does required the grasp of certain concepts before one can move on, so to speak. I found it useful'*

Using the package, students will be able to see processes occurring on successive occasions to ensure they are understood. With the students who are enrolled internally, this will release valuable tutorial time which has previously committed to discussion of the processes.

Various modules of this package can be used also to assist the teaching of other subjects which require the understanding of process. For example, understanding the behaviour of soil particles is as important in hydrology and salinity as it is to the understanding of soil structure in Soil Science.

Project 7: Hypermedia resource to teach grape and wine production (WSC110)

Project team: **J. Messing, A. Birks, J. Dick, L. Tassie, M. Allen, W. Stewart, P. Donnan, R. Hurley**

Project description

This innovation is a hypermedia teaching/learning resource to teach Grape and Wine Production (WSC110), which is delivered in the distance mode in both Australia and Portugal. The program is in CD-ROM format using a Macintosh platform and the screen display is 640x480 pixel size rather than the more customary 512x342 Hypercard pixel screen.

The educational objectives of the project were to:

- develop teaching materials which use as the basis the existing distance education materials for the subject;
- use additional expertise in viticulture, wine making, computing and instructional design to create materials that utilise a full range of multimedia resources (text, graphics, sound, high quality digitised pictures, animations and video clips); and

- extend the educational features of the learning materials to include additional facilities beyond explanations, such as embedded cross references (links) to related concepts and interactive questioning systems that provide guidance and feedback.

The following features are integral to the resource:

- Explanation text: the content/concept map is the starting point and the overall structure of the subject content is presented on screen;

- Other media: graphics, digitised video and sound files have captions, a brief explanation of the relevance of the item and links with the text;

- Links: a list of those topics which are either precursors to the node or follow on from it, is apparent to students and there is a combined glossary for the subject; and

- Objectives, questions, explanations: these features enhance the learning path and interactive dimensions of the subject.

Development process

The development process has been coordinated by John Messing who has not only produced other hypermedia programs but also teaches in the area. The development phase has been based on clearly defined and scheduled stages, including front-end analysis, concept validation, total project design and development/production phases incorporating video, graphics, software, audio and print.

The project has necessitated a multi-disciplinary approach. The video and graphics components of the subject, including vineyard, harvesting, wine production and laboratory processes, were specifically shot for the subject and have been carefully integrated with the other design features. A choice between English and Portuguese sound files will be available in the program and this has required the role of a translator during the development phase.

Regular project meetings in the early phase of the project focused on subject specialists conceptually mapping the structure of their topics in much more precise ways than is the case with print, and the creation of hypertext links and glossaries promoted an overall perspective of grape and wine production. What happens at all stages of the quality chain - in the vineyard, in the laboratory, and during the wine production processes - closely affects the finished wine.

John Messing and Andrew Birks obtained feedback from students studying the subject this year while they were in attendance at a residential school. These students viewed early versions of the program and some of their suggestions were incorporated in the interface design.

The amount of staff input during the development phase, especially in programming terms, is quite extensive and others interested in such projects should properly estimate the time and effort required to produce a quality teaching/learning resource when they submit grant applications.

Educational Benefits

In presenting this subject in multimedia format on CD-ROM an underlying aim was to stress the interconnectedness of the viticulture, winemaking, laboratory techniques and sensory evaluation strands; there was also a recognition that hypermedia is an interactive computer technology which enables students to explore information in a multi-sensory environment; and in contrast to print-based materials, the program presents a non-linear path which can be traversed by users according to their varying backgrounds, needs and interests. The resource will be used for the first time in Autumn session 1995 and it is the the underlying aims and objectives that will later be the basis for program evaluation.

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Common fallacies in subject assessment and evaluation with particular reference to Distance Education

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Introduction

As recipients of public finance it is right and proper that in the presentation of their services, universities should represent value both to their clients and the community. It would be a contradiction in terms to argue that the provision of tertiary education could be carried out effectively without promoting the interests and abilities of the learner and, by implication, benefitting the community in which learners and researchers exercise their accrued knowledge. The current emphasis on quality assurance in the delivery of tertiary education is thus unexceptional, and in a general sense, fully worthy of academic support.

Amongst other things, the term 'quality assurance' entails an assumption that criteria for success in the delivery of subjects and courses can be identified and used to assess the value of teaching to the learner. To ensure quality teaching, analysis, frank discussion, subject evaluations, informal opinions and observations which seek to improve the delivery of educational services, especially with respect to pedagogical strategies utilised, should be strenuously pursued by tertiary educators and supported by appropriate administrative services.

In order to improve the delivery of education in the field of open and distance learning the Open Learning Institute, Charles Sturt University, promotes the exchange of ideas through various activities including a series of *Occasional Papers* made available to staff from time to time. Under the heading 'A Call for Papers' in issue number 15 the editors, Peter Donnan and Anne McDonald, include an extract from a paper by Associate Professor Doug Hill from the School of Education, Riverina Campus. The extract identifies various concerns students are prone to express when they are dissatisfied with either the content they are asked to study or the delivery of subject material. Specifically, Hill lists five criticisms which may be, and one assumes are occasionally, directed at university presenters of educational materials for distance education.

The criticisms relate to authors who:

- repeat the same material at several levels
- do not present a balanced representative view of developments in the area
- fail to keep abreast of the literature and emerging issues and concerns
- present material in a boring/difficult way
- neglect to meet the reader's needs for relevance and content.

Hill (1994: 3) claims that students are justified in criticising authors whose materials fall into any or all of these categories. The argument is precise and, on the face of it, compelling. Unnecessary repetition, obvious and unrepresentative bias in selection of material, apparent ignorance of contemporary developments in an area under investigation, uninspiring presentation of content or negligence in catering for students' needs and interests all suggest valid grounds for concern over the quality of education provided.

In view of the fact that Hill refers to postgraduate offerings, it might be inferred from the extract that the criticisms are especially likely to come from students studying at that level. The following discussion examines aspects of the five areas of concern identified with a focus on undergraduate level materials.

Criteria for success in establishing the efficacy of educational programs are elusive, despite the clarity which concise aims and behavioural objectives frequently convey. In particular, differences over the intention of evaluation may arise where various parties - teachers, learners and researchers - are involved in the process. To alleviate problems of this nature it is worthwhile commenting on a number of common fallacies which may occur in arguments over criteria for success in distance education. The fallacies are particularly relevant where anecdotal accounts are given credence in subject evaluation and anonymous responses to printed questionnaires are tabulated and presented as a basis for 'objective' evaluation. They are most likely to occur where undergraduate materials are subjects for evaluation. The fallacies are:

1. fallacy of assumed student objectivity,
2. fallacy of assumed student knowledge of the subject,
3. fallacy of student driven content selection,
4. fallacy of author responsibility for student learning,
5. fallacy of third party evaluation.

1. The fallacy of assumed student objectivity

Hill claims that authors of study materials are justly criticised by students when they fail to present a 'balanced representative view of developments in the area'. The observation makes an assumption that students are aware of and sufficiently knowledgeable about significant 'developments in the area' to assess what counts as a 'balanced representative view'. The observation also assumes there is an obligation on the part of the authors to provide a 'balanced' view. The matter of what constitutes a 'balanced' view however may be a subject for contested opinion and complex debate. In some circumstances the presentation of a 'balanced view' may be impractical or even undesirable.

It is not difficult to envisage comparatively uncomplicated contexts where unrepresentative and unbalanced material might be proffered for study in a

reprehensible manner. The presentation of highly contested scientific theory as established fact, the subjective and selective promotion of a particular political theory, the advancement of a psychological theory where the author is unaware of objections to it, would not only provide examples of poor scholarship but invite legitimate criticisms over matters of balance.

On the other hand an author may seek to ensure students are aware of some particular theory - economic, scientific, philosophical etc - which might be contested in academic circles but requires considerable understanding before complex criticisms and analysis can be pursued by the learner. Furthermore, applications of the theory may be very useful to the learner despite its contested aspects. Pressure of time may render it difficult for an author to do anything more than present the theory in question. In such circumstances it is possible that a student may become so immersed in study that an impression is gained that the author has deliberately presented 'biased' material.

Similarly, there are likely to be occasions where the sheer weight of material for potential study will require an author to make a judicious selection, and perhaps decide on an unrepresentative sample, of content for study. It may be neither possible nor wise to cover a full spectrum of opinion.

On other occasions an author may seek to present material within particular parameters, deliberately ignoring alternative frameworks or theoretical positions which are judged to be outside the scope of the study in question. An author may for example be entrusted with the task of focusing on some aspect of school education in New South Wales. The author may determine to confine references in the presentation to the school system operated by the state. The author's approach may be indicative of a humanist philosophy of education, at odds with the underlying assumptions of education in various religious schools operating within the state and established by particular religious communities. The author may deem the articulation of alternative philosophies of education implying religious beliefs irrelevant to the study, though not irrelevant to the particular communities involved. Readers who maintain particular religious beliefs may however obtain an impression of bias. Such criticism would be based on reader perception rather than an indefensible lack of balance on the part of the author.

The above examples deal with situations where an author has deemed it impractical to include in study material alternative points of view forming the basis of the study. There may also be situations where calls for 'balance' are deliberately rejected by an author on the grounds that particular interpretations of 'balance' would lead to bias. Consider, for example, what it might mean to provide a balanced view of the holocaust. Should the view of controversial historians be part of a 'balanced' account in this circumstance? Does 'balance' entail a full representation of all extremist views on matters over which there is considerable majority agreement? In such circumstances an attempt to provide 'balance' may in turn result in counter-claims of bias.

To sum up, the fallacy of assumed student objectivity occurs where an evaluator takes for granted the legitimacy of a student's claim that material is biased, accepts that

'balance' can be defined and accepts an assumption that balance is fundamental to the study at hand. By default this may occur where an evaluator simply tabulates student responses: 'eight students complained that the material was biased' etc. The fallacy is overcome where the evaluator is prepared to ask: What is the nature of and basis for the student's claim? How does the claim rest with the intention of the material under review? Simply it is the difference between quantitative and qualitative research.

2. The fallacy of assumed student knowledge of subject

The fallacy of assumed student knowledge of subject in question entails the view that, given certain circumstances, students are in at least as good a position to assess the value or relevance of the material for study as authors. It is similar to the first fallacy in so far as it is tantamount to challenging an author's selection of material.

The fallacy applies to student claims that an author has ' failed to keep abreast of the literature and emerging issues and concerns'. Here the evaluator must be sure that the student is in a position to make such a claim, which is likely to require considerable subject awareness on the part of that person. As the claim is tantamount to asserting that the student's knowledge of the area in question is superior to that of the author, the validation of a student claim requires the evaluator to establish the students' bona fides with respect to knowledge of subject and make assumptions about the author's lack of contemporary knowledge of the subject. In fact, an author may have very good reasons for presenting material that has been about for a while, in which case the author's justification for selecting the material should be of course explicit.

Doug Hill observes that students are likely to complain about material they are confronted with some which duplicates previous studies. The complaint is valid, if, in fact, the material is identical to and, more importantly, treated in an identical manner to that encountered earlier in the student's course. Quite apart from theoretical and practical evidence that a 'spiral curriculum' where concepts are presented and returned to is educationally desirable (for example, Bruner, 1960), common sense suggests that any serious subject can be studied in different ways and at varying degrees of depth. On this account the fallacy is overcome where an evaluator can verify that identical material has been presented as before, in the same manner as before and applied in similar circumstances. Furthermore the evaluator will most likely be able to establish that the author was oblivious to the fact that the material had been covered earlier.

Questions about study materials which seek student opinion on matters of content are most likely to prove useful where specific information is sought. Observations such as:

> 'nine students said the content was repetitive, while eight responded that content was out of date' may appease persons obsessed with quantifying student comments but they cannot be termed 'evaluative' and without explication may evoke author responses which justifiably allude to the second fallacy.'

3. The fallacy of student driven content selection

The fallacy of student driven content selection relates to situations where a student challenges the relevance of an author's selection of material for study. The first and second fallacies related to assumptions about an author's selection of material; this fallacy revolves around student concerns for the utility of content studied.

Evaluators need to be aware of the third fallacy when considering student responses which relate to student perceptions that study material is largely irrelevant to and inconsistent with their requirements. The fallacy is most likely to surface with professional studies where students quite legitimately assume their learning will be directly relevant to their professional needs.

While it would be unforgivable for an author to promote materials which might be seen as largely irrelevant to a student's needs, it must be understood that authors may well have to make assessments about the likely needs of students who bring to their studies diverse backgrounds and levels of professional expertise. Authors should of course ensure that within their material they cater for a range of student interests without abrogating their professional responsibility for providing direction and guidance for the required study. Authors will also have to take account of the importance of rigour in tertiary study, not confusing superficial, popularist suggestions for study easily completed by students with relevant tasks at an appropriate level. Evaluators must therefore be careful when considering student criticisms of the relevance of material and firmly establish that such criticisms are more than personal preferences for what a study should or should not entail.

4. The fallacy of author responsibility for student learning

It is clearly important and highly desirable that all materials presented in distance education should arouse reader interest and curiosity; after all, true learning is indubitably linked to learner motivation. Authors should present their material concisely, clearly and, if appropriate, in an entertaining manner. At the same time authors are entitled to assume that students engaged in tertiary study are equipped with the knowledge and understanding to assimilate material at a relevant level of abstraction.

Arousing and maintaining student interest is not tantamount to 'spoon feeding'. There may be occasions where an author considers a particular work in the field indispensable to a student's study, even though the language used and style of writing may be obscure or obdurate. In such circumstances it is encumbent on the author to provide an appropriate commentary; even so, the student must accept ultimate responsibility for mastering the material.

The fallacy of author responsibility for student learning occurs where a student claims material is too difficult or so uninspiring that motivation for learning dissipates, without having made a conscientious effort to come to grips with the content and seeking help from the presenter. To avoid this fallacy an evaluator must be certain that the student has made an honest and worthy attempt to master material presented

and that criticism of this kind is not merely passing the responsibility for learning on to the author.

5. The fallacy of third party evaluation

Authors of distance educational materials should go to appropriate lengths to ensure their materials are beneficial to their students. Generally authors are likely to be well placed to engage in ongoing evaluation of materials, especially where they deal with student enquiries, mark student assignments and discuss their material with interested professional colleagues. If carried out properly such evaluations are, in the long run, likely to be the most productive.

In seeking quality assurance it is obviously important to have recourse to student opinion.

Views students express will sometimes be personal and subjective, perhaps being unduly influenced by marks or grades they have received for tests or assignments they have submitted. Other student responses will be more objective and thus more likely to be valued by authors and presenters. It is therefore essential that questionnaires or other evaluative procedures used to monitor student opinion should be soundly thought through, dealing specifically with matters which are clearly of relevance to authors and presenters. Consultation between authors, presenters and persons monitoring student opinion throughout the process is obviously crucial to productive evaluation. Persons tabulating responses, compiling summaries or even 'assessing' student opinions, not directly solicited by the author, must be careful about the methodology they employ and the interpretation they give to data obtained. Academics, researchers and administrators in tertiary education are at least as prone as anyone else to generalise from particulars, quite often relying on unrepresentative opinion as a basis for complex argument.

'Accountability' , 'quality assurance' and like terms are easily equated with the multifarious activities of an industrialised economy concerned with production. In such a climate evaluators may fall prey to a temptation to seek information which is readily amenable to statistical representation. Questionnaires issued and tabulated responses may be utilised as 'evidence' to support arguments about the effectiveness of distance education.

Often the tools used by collators and evaluators are standardised, perhaps to make comparisons clear, perhaps for administrative convenience. Such devices have obvious advantages when general trends are sought. The chief danger in utilising standardised tools is that quality information is less likely to be forthcoming and statistical data may distort the value of an author's work because of the fallacies outlined above. The following extract from the student evaluation section of the subject *History of Evaluation* 9 (Cresswell, 1994), replicated in other subject study guides, partially illustrates the point:

The textbook was useful	*SD* *strongly disagree*	*D* *disagree*	*A* *agree*	*SA* *strongly agree*	*NA(4)* *not applicable*

Responses may provide an overall guide to student opinion of the text. However the information is of limited use if the author is uncertain about the basis for the students' judgements. An author might ponder: How did (did not) the text contribute to the students' overall understanding? Was (was not) it easy to read? Did (did not) it stimulate and promote further study? Was it helpful (unhelpful) in getting the assignments done? (A disillusioned author might even ask 'Did the student actually obtain the text?'!)

The illustration is not to decry the use of questionnaires but to indicate that responses may be quite diffuse even though they all appear under the same category, SD D etc. In any case, responses of this nature could be evaluated in conjunction with a presenter's account of how the textbook was utilised by students in meeting assessment requirements for the subject.

The fallacy of third party evaluation may occur where inappropriate general statements are made on the basis of marks on a standardised form. To overcome the problem, questions students are asked must be very specific, risking the possibility of a lengthy questionnaire which people may not bother to complete. The most effective evaluations are likely to occur where authors and presenters are directly involved.

Conclusion

Ongoing evaluation is a vital aspect of distance education. Student involvement in the process is highly desirable. However, it must not be forgotten student responses are personal and individual. Generalisations from this source require careful construction - especially where they are based on aggregation of ticks in boxes or circles around letters. All parties engaged in the evaluation of distance education materials need to be aware of the dangers of generalisation and strenuously avoid the potential problems they occasion when compiling their reports.

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Student use of intext activities

A. McDonald

Abstract

This paper examines student use of intext activities within distance education mail packages. The literature review gives an overview of recent research and ideas on the use of such devices. The research project was conducted at two residential schools at Charles Sturt University-Riverina in spring session 1993. Two groups of Social Work students were surveyed. They were asked about their use of specific intext activities which were drawn from the material which they were currently using. A second question dealt with their general attitude towards inclusion of intext activities in study materials.

Note

This is an edited version of a paper written for the OLI. The full text is available from the author.

Introduction

Intext activities are known by a variety of different names, but the term generally refers to questions or activities within the printed study material sent to Distance students. They are generally non-assessable and may or may not relate to an assessment item. These activities may be complex, requiring the students to do a great deal of work or just require a simple response, e.g. tick the box or write a word or two. Some activities leave space or lines for students to write a response, while others do not.

Academic authors are encouraged to include such non-assessable tasks in the study materials they write. Whether or not students use the activities in the way in which they are intended is a matter of some discussion, as is the leaving of lines or space for the answers to be written. It is this topic that is examined in this research paper.

Literature review

A brief review of the literature reveals a consensus among researchers regarding the value of activities in instructional material (Lockwood 1992; Rowntree 1986; Evans and Nation 1989, Marland *et al.* 1990, among others). Rowntree (1986:120) says that '...without such activities, our learners might assume that the only objective was to memorise our multitudinous words of wisdom.'

Design concepts

Lockwood (1992:25) describes three concepts forming the basis of activities.

Tutorial-in-print. The integration of questions within the text to encourage an active response on the part of the learner. The learner is asked to respond to a variety of questions and either actual answers are given, or there is commentary or feedback in the following material. Learners could be asked to recall, draw together arguments, interpret data, define concepts, work out examples and so on. Tutorial-in-print activities are most appropriate when there is a body of knowledge to be mastered (Rowntree 1973, quoted by Lockwood 1992:33)

Reflective action guide. Independent learning is encouraged and learners must reflect critically upon their actions. Important learning can take place outside the package and during a course of study the nature of activities may be so varied that the outcome might be difficult to predict. In order to guide the learning experience the student sets their own parameters for the activity, which is often time-consuming and related to the unique situation in which the student is located. Resources, guidelines and suggestions may be offered, but feedback is not possible. The learner needs to gather and assess feedback themselves.

Dialogue. Evans and Nation (1989) discuss the importance of dialogic activities within the learning material. For them the term dialogue involves the idea that humans in communication are actively engaged in the making and exchange of meanings (1989:37). Students must be seen as the key agents in their own learning and need to be encouraged to be critical and actively engaged in constructing meaning for themselves, rather than receptacles for information. Study materials should provide for dialogue with the students, giving them knowledge, skills, ideas and values which are relevant to their needs and interests and which can be used actively to understand, manage and change their social worlds.

Writer's assumptions

Lockwood discusses a number of assumptions which writers of learning materials hold (1992:72-75). These can be summarised as follows.

Assumption 1 Activities are an integral part of the teaching, drafted and developed alongside other materials.

Assumption 2 Interest and enthusiasm for the subject can be created through activities.

Assumption 3 A variety of formats and types of activity should be presented in the learning material. A range of intellectual responses should be allowed for - from recall and comprehension to analysis and evaluation.

Assumption 4 Activities contribute to the order and structure of the material, giving a framework for the optimum route through the material.

Assumption 5 Completion of activities will foster learner independence. Activities will encourage students to ask questions about the information and encourage them to find interpretations other than those offered by the writer.

Recording responses

Henderson found that closed ended questions motivate a large number of students to respond and that students are more likely to respond to open ended questions if space is provided for the answers. He believed that the space made it convenient to answer, while the provided space gave an indication of the required length of the answer. Lockwood (1990) confirmed this, finding that students who said that they seldom responded to intext activities found themselves drawn into the process by the supplying of a grid for answers.

Student responses

- ***Course focused benefits***. The activities contribute to the student's understanding of the material.
- ***Self focused benefits***. Activities contribute to the student's development, providing an opportunity to explore ideas, challenge assumptions, awaken personal interest and so on.
- ***Assignment focused benefits***. Activities contribute to the building up of material for submission for marking .

Lockwood describes students as being time spenders or time savers, seeing activities as either a hindrance (cost) to studying or as an aid and an integral part of their study (spenders).

Follow-up

While writers are keen to use activities as an integral part of their materials, they seem less willing to supply unrestricted access to answers or follow-up. This attitude fails to take into account the value of immediacy. Learners are keen to move along, and accessible answers or immediate discussion is helpful to the students. The aim should be to facilitate smooth progress. Rowntree (1986:133) recommends that the answers or discussion should immediately follow the activities.

Position in text

Students tend to be more diligent in their response to activities placed near the beginning of the material. As they progress through the material they become pushed for time. Activities containing more than one task tended to have diminished completion rates.

An alternative approach

Marland, *et al.* suggest that many of the strategies mentioned above may be too coercive for learner centred materials and proposed a need for alternative approaches to the design of distance learning text. One such alternative might involve providing largely unstructured textual resources relevant to the subjects' main issues, themes and bodies of knowledge and allowing students to generate or select some of their own assessment tasks with guidance from their distance facilitator. This is a dialogic approach, as described by Evans and Nation, allowing students to use the material in ways that suit their particular environment, background and needs.

Conclusion

Marland *et al.* suggest that writers need to be explicit about the expectations as to study strategies to be employed; the level and quality of student responses; and types of cognitive processes to be used when completing the activities.

Questions which are buried in the text often go unanswered as students don't know whether to respond or not. Activities are often presented with unrealistic time demands, overloading students who then skip them. Activities which are not skipped may be diminished markedly by students trying to 'save time'. While writers may include activities in an attempt to manipulate the students' learning path, students will take what they require or can cope with and reject the rest. Space left for answers may encourage students to fill them in, and the space gives an indication of the length of the required answer. It is important to consider the style of activities, using those which best help the student to become an independent learner. For subjects in which the content is all-important, e.g. mathematics, tutorial-in-print activities are probably most appropriate.

To increase the rate of student completion of in-text activities, Marland *et al.* also suggest:

- structuring the instructional text in a way that emphasises a cumulative, interactive, organic view of learning
- designing assessment activities which require re-interpretation
- using outcomes of activities as pre-requisite knowledge for further study
- making completion of some intext activities compulsory

If none of the above methods suit the writer/students in a particular course, then a dialogic structure could be considered.

Methodology

Subjects

Social work students attending the Spring session Residential school in 1993 were chosen as the subjects for this research. There were two groups, one of first year Distance students and one of second year Distance students. They are called Group 1 and Group 2 respectively.

Instrument

A simple survey instrument was devised, asking students to look at activities from material they were currently studying. (Copies of the activities were attached.) They were asked what they did when they came to each activity, e.g. write an answer or think about it. They were then asked to give a reason for completing it or not, e.g. completed it out of interest, or it was too time consuming etc.

A final question asked students to comment on their reaction if the next set of study materials they received contained no intext activities, study tasks or questions to respond to.

Procedure

For each of the two groups, five intext activities were chosen. The activities were chosen as a sample of different types of intext questions/activities: e.g with lines provided for answers; answers supplied; simple answers; complex answers; topic review; embedded in the text.

The students were given copies of the activities and asked to respond to each one. If the student had not studied the particular subject from which the activity had been extracted, then they indicated this on their response sheet. There were approximately 25 students in each group, but a varying number of students responded to each activity.

Group 1

Description of activities

The following is a brief description of the activities to which the students responded.

Activity 1 16 groups are listed for the students to classify according to a typology which has been discussed in the preceding section. No space has been set aside for the answers, but they could be jotted down on the side of the page. Answers to this exercise are provided but students are invited to consider why their answer may differ from that given.

Activity 2 Three lines are provided for each answer. Students are asked to reflect back to their previous practicum and note different aspects of that experience.

Activity 3 Stick figures each with a speech balloon illustrate this activity. It is directly related to the instructional text and despite its apparent simplicity, revises and reinforces that material.

Activity 4 A great deal of work is required for completion and answers need to be noted on a separate sheet of paper. There is no feedback provided.

Activity 5 This is a question which is embedded in the notes, requiring reflection on the part of the student.

Responses

The two intext activities which created the greatest response were *Activities 1* and *3*, the typology activity and the picture exercise. 25 students responded positively to *Activity 1*, having either written an answer or thought about the typology. The picture exercise (*Activity 3*) also generated a large response from the students, with 27 either writing an answer or thinking about it. In both of these cases, students also used the activity as a tool for revision. Only 2 students said that they skipped *Activity 1* and all respondents attempted *Activity 3*.

In comparison with this response, *Activities 4* and *5* generated a low participation rate. Only six students either wrote a response or thought about *Activity 4*, while the embedded question (*Activity 5*) elicited no written answers and did not even stir the students to think about the issues it raised. The time factor was perceived by the students to be a major drawback to the completion of *Activity 4*, with 11 students citing this as their reason for not doing anything constructive with the activity. Five students gave lack of time as a reason for non-completion of *Activity 5* while another five cited its unrelatedness to an assessment item as a reason for passing it over.

Activities 1 and *3* were perceived to be quick, interesting and leading to a deeper understanding of the topic. Students also responded to *Activity 1* because the answers were supplied. Those few students who did respond to *Activities 4* and *5* gave interest and a deeper understanding of the topic as their reasons for doing so.

17 students either wrote a response or thought about it *Activity 2* while only four skipped it altogether. A few saw it as taking too much time, while on the positive side, a few felt that it was related to the assessment, had space for the answers, and led to a deeper understanding of the topic.

Group 2

Description of activities

Activity 1 Students work through a series of steps as though they were setting up a group. There are nine points listed to guide them.

Activity 2 This looks like a simple, tick the box activity. However, in order to do that, students are required to do some field research.

Activity 3 Space is given for answers. There are a number of questions for the students to respond to, giving them the opportunity to reflect on the material and add comments and thoughts of their own.

Activity 4 Students are directed to two readings. Three questions are included with lines on which to jot down answers. The final step encourages the students to discuss the readings with their field teacher.

Activity 5 This activity consists of a series of questions followed by eight brief case examples. Students are invited to comment on each one in view of the preceding comments and questions.

Responses

In this set of activities, the lines are less clearly drawn. All the activities had at least 11 of the students who had either written a response, or (more commonly), at least thought about the issues. *Activity 3* had a high number of students who skipped it all together (12). In all cases, there were students who said they had read the lecturer's comments and in all cases at least one student used the activity for revision.

For those students who did not complete the tasks, the major reason given was that the activity in question appeared to take too much time to complete. Not being related to assessment was also a factor, especially in *Activities 1* and *5*. The lack of feedback did not seem to be significant. Many students completed the activities out of interest, while gaining a deeper understanding was a motivating factor in a number of cases. On the whole the students who completed the exercises did not see them as being particularly quick or simple.

General views of both groups on intext activities

The survey asked students to note down their likely reaction if the next set of study materials they received did not include any tasks or questions. The overwhelming majority of responses was that the tasks are necessary for learning. Some said that although they did not always put pen to paper they at least paused to reflect on the issues being raised in the activities. A common response was that the tasks and questions were good indicators of the main ideas and themes running through the

notes and for that reason were an aid to understanding. Students acknowledged that they respond only to some activities

The responses highlighted a number of areas. Some students requested feedback, while a number commented on the relationship of the activities to the assessment items. Time was also a factor, with at least one student suggesting that some indication of the time to be spent on the activity would give an idea of its importance. Students also saw the activities as being a part of the structure of the subject, breaking the notes, allowing for a change of pace, and a time to pause for reflection. A few students commented on the design of the activities, with one requesting visuals rather than words all the time, another asking for variety within a subject. (This was a comment attached to an activity from a year-long subject.)

Conclusions

Academic authors should be encouraged to insert intext activities into their study guides in order to give students an opportunity to reflect on and respond to the material they have been studying. However, as the foregoing research and student comments indicate, students require well thought out activities that will assist them with their learning. Interesting and innovative activities will encourage the students to stop and complete the exercises, thus gaining a deeper understanding of the topic under study. One area which did come to light was that some subjects have too many long and complex study tasks which become impossible for students to begin, let alone complete. Some of the tasks which were looked at in this study required a considerable amount of time and effort on the part of the student and yet there was no feedback and no link to an assessment item. At the other end of the scale, some subjects have too few activities, with virtually no break in the study guide. Students need well designed activities to point them in the direction of the major ideas and themes to pursue.

Activities may be designed with specific outcomes in mind, but students are free agents and will use them as they like. Instructional designers can critically examine the activities being included within the study guide. Some factors to bear in mind are:

- interest
- time required
- complexity
- relevance to learning outcomes and/or assessment
- feedback
- depth of understanding or regurgitation of preceding material
- appropriate style

From this small action research project, it has been established that interesting and relevant activities will be considered by most students, even if they do not write a

response. Generally, students will at least pause to read the activities, some using them as a logical point to stop and have a break from their notes. Leaving a space or lines for answers did not seem to be a factor in their use, but they need to be clearly set out so that students understand what is being asked of them. If they are related to assessment or deeper understanding of the material they serve a useful purpose in the student's study program.

It would be an interesting further step to pursue the idea of dialogic activities and compare student depth of learning from such activities and those of a reflective and tutorial-in-print approach.

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A survey of interactions within a specific cohort of students

J. Harris

Abstract

In 1994 a new degree was offered at Charles Sturt University . This degree was designed for people who wanted to become TAFE teachers or trainers in industry. It was assumed that most of the students enrolling at the basic entry level of this course would not have strong academic writing skills. Consequently their first subject aimed at involving them in interactive ways with the learning materials, with the lecturer, and with each other. This paper examines how this was done, and how effective the interactions were.

Introduction

This paper examines the kinds of interactions that took place within a first level distance education subject written for the Bachelor of Teaching (Vocational Education and Training). The subject aimed to develop essay writing skills and referencing skills, so that these students could confidently approach the rest of their university studies.

There were several assumptions about this group of students. One was that they all wanted a qualification which would either increase their chances of becoming permanent teachers in TAFE, or of becoming trainers in industry. It was also assumed that these students would have had little, if any, experience with academic writing, and that they would benefit greatly from a subject which aimed to develop these skills. In order to gauge the success of the subject, it was decided that each student would be contacted and asked whether the subject had been of value to them and what sorts of interactions they had been involved in.

Although there has been considerable debate about what constitutes 'interaction' (Daniel and Marquis, 1979, Moore, M. 1989), for the purposes of this study interaction 'requires at least two participants and at least one of them must be a person' (Juler, 1993: 134). Thus the study looked not only at students' interactions with other people but also at their interactions with the course materials. Since interaction in education also 'means *effective* engagement in the available forms of discourse' (Juler, 1993: 144), one aim of the study was to consider how effective students felt their studies had been. It also aimed to indicate which features of interactivity were most useful and also to highlight any areas which could be improved.

A questionnaire about interactions

Seventeen students were surveyed about their interactions with the lecturer, other students, the university, family and friends, colleagues, the materials themselves, and about their access to various media. A questionnaire was designed and each student was telephoned and asked if they would mind answering some questions about the subject. The dangers of invasion of privacy and misuse of information discussed by George (1993: 55) were kept in mind, but it was generally felt by the authors and the students that the survey was acceptable if it was going to provide useful information that would benefit other students.

The questionnaire asked about each student's educational background, present employment, prior experience and confidence with writing, and their perception of their post-subject ability with academic writing. As well they were asked to comment on various interactions which may have occurred. These included any interactions between students and the lecturer (phone calls, personal contact, and feedback comments on returned assignments), student-student-lecturer (teleconference), students setting up their own study networks, students and the university, students and their families and friends, as well as students' interactions with their learning materials.

There are many possible classifications of distance education students. For instance they may be classified by age levels, education levels, whether they are fee paying or not, whether they have chosen distance education or whether it is the only option, or whether they are full time students or employees studying part-time. The one thing that all seventeen students surveyed had in common was the end goal of becoming TAFE teachers or industry trainers. This seemed to provide some of the motivation necessary to enable these students to continue their studies despite problems associated with work and family commitments. As Holmberg suggests (1989: 45 and 185), motivation is what distinguishes the successful from the drop-outs in distance education.

The theory underlying the subject

Because it was assumed that students would lack academic essay writing skills, the subject was based, to a large extent, on behaviourist outcomes. For instance the expected outcomes for module 1 were that students would 'have a better understanding of the communication process; would know how to plan and structure a piece of writing; and would be able to recognise and use plain English'. Similarly the learning outcomes for module 2 included the expectations that students would 'possess an understanding of the purpose of referencing sources of information; be able to cite references appropriately; be aware of ways to locate reference material to meet a particular need; and know some strategies for reading reference material effectively'.

However the authors of this subject were committed to a cognitive constructivist learning theory and were concerned with meaningful learning whereby 'the learner takes responsibility to construct meaning actively, not in isolation, but through dialogue with oneself as well as others' (Garrison, 1993: 201). The authors aimed at

the students developing an *understanding* of what they were learning in order to carry this knowledge throughout the rest of their studies. Such an aim is supported by DiVesta and Rieber (1987: 221) who suggest that 'Understanding is an effective objective since it makes provisions for material to be assimilated and integrated into the learner's knowledge structure'.

The following beliefs were incorporated into the structure of the subject:

> Learners must be actively engaged in integrating new information into existing knowledge structures ...[I]ndividuals build upon their previous experience and cognitive structures to develop new views and knowledge structures. Through dialogue we ensure the learner's active construction of meaningful knowledge... The goal is not simply the assimilation of facts. To account for deficiencies in previous knowledge structures, teachers must relate new knowledge structures to those already possessed by students. This demands extended two-way communication between teacher and student... (Garrison, 1993: 202, 203)

It was on this theoretical basis that the subject was written, with the aim of involving students as much as possible in dialogue with the lecturer, each other and the printed course materials. Juler (1993: 138) lists the following as 'key entities with which a typical student in open and distance education is likely to interact regularly and frequently...'

- learning materials - study guides, readers, audio, video
- administrative subsystem - enrolment officers, student advisers, exam clerks
- academic subsystem - student support by lecturers, tutors, counsellors
- other students - small groups for project work, practical work, discussion
- personal worlds - family, close friends, home environment
- professional worlds - workplace colleagues, professional societies

The following interactive features were incorporated into the subject:

- A student profile sheet was included in the subject outline for students to complete and return to the lecturer early in the session. This provided information about previous educational experience, and recent writing experience. Such a non-threatening form of dialogue enabled the lecturer to briefly assess each student's prior knowledge - a feature of the cognitivist paradigm. It also provided an opportunity to advise any students who appeared unsuited to the course of more suitable alternatives.

- A teleconference was scheduled for all students after the first assignment had been returned. As well as providing a forum for comments students might have about particular aspects of the subject, the teleconference was designed to encourage students to consider networking with each other, especially those within close geographic proximity.

- The subject materials were written in a user friendly style in much the same way as a conversation. Such an approach is endorsed by Evans and Nation (1989: 40) who claim that the best text-form for minimising the distance between teachers

and their readers is the 'implied dialogue' which uses personal pronouns to draw the reader into the text. Module 2, for example, begins:

'As an external student you will probably write three or four assignments for each subject you study. Your understanding of the content of the subject will be judged by what you write and how well you write. For this reason it is important to understand the 'ground rules' for academic writing before you start!' (Hill,D and Smith, E, 1994: 3)

- Throughout the study guide there were activities designed to encourage students to interact with the text. For example in the module on written communication, one activity asked students to read an example of a convoluted letter and then rewrite it in the space provided. Although there was no example of that particular letter rewritten, immediately following there was another letter written in plain English which students could refer to.

- Apart from individual written comments on each of the three assignments, the lecturer provided overall comments about the strengths she had identified within the group as well as any areas that could be improved. In this way the 'weaker' students were able to gain from the combined knowledge of the group and hopefully take account of the suggestions for the next assignment.

- The lecturer provided very clear directions for how students could contact her, and if she was unavailable, they were able to leave a message on voice-mail. Calls were returned promptly, so student-lecturer dialogue was easy to establish.

What the survey showed about student-student interactions

Before considering what interactions took place in this group of students, it is worth looking out how closely the assumptions about them matched the reality. Although it was assumed that none of the intake had completed university qualifications, one had completed a Bachelor of Business Studies and several others had studied at university. One had only done one subject in a Social Science degree, one had finished the first year of a degree, one had completed half the subjects in a Bachelor of Arts, and another had completed half a Science degree. In addition, several had Diploma qualifications from CAEs (Colleges of Advanced Education), and one was a registered nurse. For all these courses these nine students had been required to write 'academic' essays. The other eight students had various TAFE certificates and two had completed the RAAF Instructional Trainer's (IT) course.

As a result there was quite a wide range of confidence in the way students approached their study and this appeared to influence their perceptions of how much 'help' or interaction with other people they felt they needed. Those who had some prior experience in writing 'academic' essays found the subject easier than those who had none. In most instances those who had prior experience used the subject more as revision and refining of existing knowledge and did not seek interaction with other students.

However in one case, two students living in the same small rural town worked together. One had some prior experience with academic writing and was able to help the other student who was a very reluctant writer. They met once a week to discuss problems and ways of attacking the next assignments. Although one appeared to have more 'knowledge' than the other, it benefitted both in that it gave the more able writer experience in helping an adult learner, and it gave the less experienced writer confidence in their ability to succeed.

Another interactive network was formed within a group of three students who all taught at a TAFE college in a rural community. When asked about the nature of the interaction they responded that there had been informal discussions rather than a study network, that they had 'supported' each other rather than discussed specific questions. However, isolation and poor social integration with other students, university teachers and administrative staff are some of the problems which Peters (1992: 239) claims can cause students to drop out of courses. Thus this type of support network can be seen as an important form of interaction. According to Ismail (1988) this kind of physical contact, which can also be found at residential schools,

> ...also gives experience of working in groups...gives one a chance to share experiences with other students...Some of us end up becoming the best of friends (page 256).

Apart from these face to face interactions, the only other student-to-student interactions took place within the teleconferences which successfully involved ten students (technical problems precluded at least three others, and the other four were unavailable on the nights suggested). From the survey it appeared that the greatest benefit of the teleconferences was for students to realise that the problems they faced were not theirs alone, but that they were 'all in the same boat'. This knowledge seemed to give them confidence in their own abilities to study alone since only the first two people discussed above formed an interactive 'partnership' as a result of the teleconference.

Student-lecturer interaction

There were several levels on which students interacted with the lecturer. Firstly she had written much of the course material, so the students interacted with her written communication whenever they read the study materials. Secondly they all received written comments from her on their returned assignments. Thirdly thirteen of them telephoned her during the session to clarify the assignment requirements. And finally, ten of them took part in the teleconference which the lecturer 'chaired', so they all had an opportunity to talk to her and/or ask questions of her. Such an experience is an example of the 'dialogue' described by Evans and Nation (1989):

> There is nothing novel in calling attention to 'dialogue' in distance education. Many theorists and practitioners have made significant contributions to the literature in this regard; and work by Perraton, Moore and Holmberg, represents these achievements... . Following these theorists, an approach which makes dialogue central in distance teaching and learning conceives of students as active participants, even when they are remote in time and space from their teachers.

> Above all, this approach does not have absolute faith in the completely self-contained instructional package (pages 37-38).

By incorporating such features into the subject, the lecturer invited dialogue with the students and encouraged them to interact with her and with each other.

Student interaction with the printed material

In the survey the students were asked if they had found the style of writing in the study guide easy to understand and user-friendly. As mentioned above, the authors had deliberately chosen a converstional style of writing in order to increase the sense of dialogue with the students. On this point Juler (1993: 123) has paraphrased Holmberg (1989: 43) and the following points relate particularly to the use of conversational style:

- Students are likely to relate well to teachers if they get good study materials backed up by some form of two-way communication.
- Converstional style promotes good relations between teachers and students.
- Conversational style aids understanding and memory.
- Conversational style is possible in any distance education media.

One of the features of the study guide was the provision of study tasks designed to give students practice in applying the concepts they had just read about. Space was left for them to write their responses. However from the survey it appeared that students had generally only thought about the tasks and had not actually put pen to paper. Whilst 'thinking about' is still a valid form of interaction, it may be worth considering including some model answers to the tasks when the subject is revised so that students can check if they are on the right track.

The study guide was arranged in sequential modules, each of which had clearly stated aims and objectives, summaries of topics, and a variety of pictorial items to break the monotony of text. These devices fitted well with the following instructional activities which Gagne and Briggs (1979: 264-266) claimed are required in order for learning to take place:

- inform learners of the objective by making them aware of the instructional goals
- stimulate recall of prior learning;
- elicit performance by directing students to perform activities that give them an opportunity to practise and apply newly acquired skills;
- provide formative feedback that reassures the students, suggest remedial action to improve their weaknesses, and give them an opportunity to go beyond the immediate situation;
- enhance retention and learning transfer to new situations;
- assess performance or provide a summative evaluation of the students' progress.

Interaction between students and the university

The students had felt very little need to make contact with any sections of the university other than the lecturer. Three commented favourably on the interaction they had had with the library, and expressed a high level of satisfaction with the service they had received from there. Two others had had dealings with administration over HECS payments and had also been satisfied with their interactions. The other students had not felt any need to contact the university.

Interaction between students and their families

This varied from individual to individual since each student's family situation was different. The three women who worked at the same TAFE were all in the position where their children had grown up and left home. Since their partners were supportive of their desire to study, there was positive interaction between them.

In another case, the student's parents were very ill and lived some distance away. In addition, his work situation was such that he boarded away from home three nights a week. Although his family was supportive of the notion of him studying, his responsibilities meant that he had very little time for study when he was at home since he had to visit his parents regularly as well as taking part in normal family life.

Whilst two of the students did not form any interactive network with other students doing the same subject, both had partners studying part-time as well. Consequently they were able to discuss issues and queries with them, a process both of them acknowledged was very useful.

Only one student lived by herself. The others all shared the frustrations of most distance education students who work and study and live within a family. Some of them felt their families resented the time spent in study; some felt they squeezed their study in to least inconvenience their family; others felt that the family was most supportive and routines had been rearranged to cater better for the student's needs. In short there were varying types of interactions between students and their families, as was to be expected.

One student's interaction network

When Jann enrolled in the course, she had already studied at university, having partially completed a Bachelor of Arts (Psychology). As well she was a registered nurse. Consequently she felt reasonably confident about her ability to write academic essays. At the time she was studying the subject under discussion, she was also working as a Family Day Care mother and was looking for a way of becoming a TAFE teacher. Whilst her husband was supportive of her studying, she found the constant demands of working with young children tiring. However she was impressed with the clarity of the study materials and with the positive interaction she had with the lecturer when she had a query. The lecturer also pointed out that another student

in the subject lived in the vicinity, and that they might be able to contact each other. This in fact happened after the teleconference, and the interaction proved beneficial to both students.

Figure 1 is an interaction network diagram showing Jann's interactions for this subject. The intimate zone refers to her interactions with family members. It also contains interactions with her family day care charges since they directly affected how much time and energy she could bring to her study.

The effective zone refers to Jann's everyday world of contacts necessary for effective action, and the learning materials for the subject are shown here. Although she commented favourably on the conversational style of the study guide, it did not appear to impinge on her intimate zone. Similarly her contact with the other student and with the lecturer appeared to fit most appropriately into the effective zone.

Because she had very little contact with the university except for the mechanics of enrolment, despatch of learning materials, and assignment turnaround, this aspect of interaction appears in the nominal zone - the world at large.

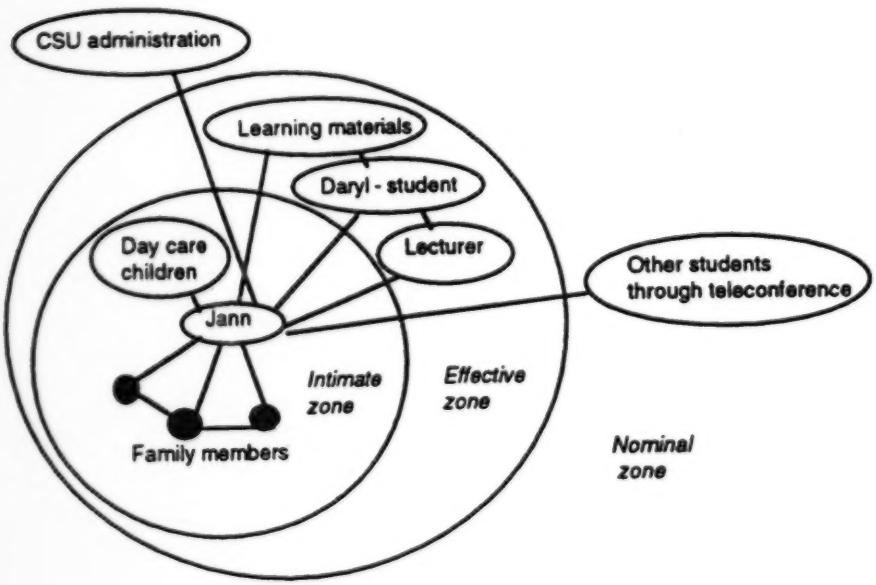

Figure 1: Jann's interaction network

Conclusion

From this study it appeared that no matter how much opportunity for interaction educators build into distance education materials, if students don't want to interact with other people they won't. Some students just want to interact with the text, and in the subject under discussion, all spoke highly of the clear, conversational style of the

study guide which they had found easy to interact with. Whilst only two of the seventeen had written responses to the study activities, the others had thought about them - a form of interaction.

All those who took part in the teleconferences said that their best feature was that through discussions, they each realised they were all experiencing similar frustrations and problems. Whilst such perceptions may not be measurable learning outcomes, they are still important in the motivational aspect of learning, since the social aspect of an interactive network is also important.

Recommendations

Although not all students took part in the teleconferences, those who did commented on how beneficial they were. I would recommend that this subject retain the teleconferences, and that the university encourage wider use of this interactive form of dialogue.

Students found the conversational style of writing easy to interact with, and a good substitute for face to face teaching since it gave the impression of the writer directly addressing the reader. I recommend that authors of distance education materials be encouraged to adopt this style of writing wherever possible.

The lecturer was readily available, a fact which the students readily appreciated. If she was not there when they telephoned they were able to leave a message on her voice mail. I recommend that academics be encouraged to provide students with consultation times so that they know when it is likely they will be able to contact them. Often personal interaction, either face to face or by telephone, is the preferred form of interaction, although technological devices such as email and voice mail should also be considered more often.

When asked how the subject could have been more interactive, one student suggested that audio cassettes could have been used, and with some creative thought on the part of designers and authors, incorporation of these may have provided another form of interaction. I recommend that the use of audio - and video - recordings be considered more often in the preparation of distance education materials.

Two students suggested that a residential school may have helped overcome feelings of isolation which some students experienced. However several other students would not have enrolled in the course if there had been a residential school component so this form of interaction can be a vexed question. I recommend that the forms of interaction discussed above be implemented before residential schools are introduced.

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Instructional design: A different perspective

E. Holgate

Abstract

This paper was written to provide an example of instructional design and distance education occurring outside of the Higher Education sector. The author was involved extensively with a project which completely re-defined the aircraft trade training structure within the RAAF. This process changed the mode of delivery from 'in-house' to predominantly distance education. (The terms instructional design and training design can be considered synonymous throughout this paper)

Background

The past decade has seen a major shake-up occur within most Australian organisations. The advent of *Award Restructuring and Workplace Reform* has heralded a need to review the structure of organisations and the work practices therein. Old, narrow job descriptions have been replaced by new multi skilled categories, with some jobs being redefined, others redesigned, and others being grouped.

The Royal Australian Air Force has not been unaffected by this industrial turmoil. There has been increasing demand for the Defence Forces to operate more efficiently and justify their existence. With ever tightening budget constraints and calls for downsizing of the workforce, the RAAF has had to develop ways to operate smarter.

The RAAF has undergone extensive reorganisation in an attempt to streamline its operations. Some musterings are being disbanded while others are being amalgamated and /or multi skilled. Hand in hand with this reorganisation has been the need for development of training courses to reflect the changes that have occurred.

Aircraft trade training

Aircraft trade training in the RAAF has been conducted at many different locations, utilising a variety of instructional methods since the formation of the Australian Air Force in 1921. Most training courses have been conducted within a RAAF school, where the student would be trained to the technician/tradesman level (in one of 7 different trades) before being allowed to work on actual aircraft. This has required the establishment of large schools to cater for this training and the numbers of students (up to 2000 students would be trained per year, depending on defence requirements and political influence). Courses varied in length from 9 months to 3 years, during which time the student attended classroom lessons and practical sessions for 38 hours per week for the duration of the course.

A new structure

Perceived deficiencies in the effectiveness of the workforce, the efficiency of the training system and the lack of flexibility to cope with changing technologies, highlighted a need for change. Several outside agencies, which had been involved with restructuring of their workforce, were consulted to identify the best direction for the development of a new training structure. Some of the agencies consulted were:

- Royal New Zealand Air Force
- Royal Air Force
- Canadian Forces
- United States Air Force
- Australian Domestic Airline Industry
- Telecom Australia
- Albright and Wilson (UK Chemical Company)

This identified a need to radically change the way the RAAF had trained in the past. The new structure should amalgamate many musterings (the new structure would have 3 trade groups (multi skilling) and provide skill levels through each new trade group. This would allow the RAAF to train people to the level they needed for their current job (just-in-time training) and provide career paths which articulate fully from one level to the next (vertical skilling and articulation).

Project design team development

In 1991 a Training Design project team was established to develop the course ware needed for the proposed trades and courses. This team was initially established with 26 people, the majority being aircraft technicians who had some teaching experience. These training designers were employed full-time in developing the required course ware and involved in all aspects of the design process (from initial conception of a course through to implementation and evaluation of the final product). To ensure the accreditation of the new courses, some liaison with external agencies has occurred to align course ware with the National Aerospace Curriculum. The project has consisted of two phases, the first phase involving the development of print based material for all course subjects and the second phase involving the further development of course ware utilising other instructional media. The magnitude of the project caused the team to grow to approximately 70 people during 1993.

Modes of delivery

With the development of the new courses there was the possibility to change from the 'in-house' type of training which existed previously and establish distance education centres around Australia which could be attended by students in that locality. Students are now able to attend a training centre at a time more suitable to their personal circumstances and their supervisor's requirements or the student can study

the material where and when they prefer. The course ware being developed will cater for the following modes of delivery:

- Classroom lessons
- Distance Education (at a training centre or by student self study), using the following media:
  - Print based material,
  - A/V packages, and
  - Computer aided instruction.

Quality issues

The magnitude of the task and the desire to achieve a quality end product has meant that many issues have needed to be addressed. Some of these issues were:

Quality Management Principles

The management of the project has been of collaborative style with much of the decision making occurring through input by many team members. This has involved the application of TQM principles and the use of group processes to develop ideas and foster quality improvement. This has generated a sense of team effort and ownership of the product.

Instructional Design

The RAAF uses a structured and systematic procedure for training design. This procedure is embodied in the model for training development utilised in the RAAF (RAAF Training Cycle). This model (in simplified form) consists of 4 phases as follows:

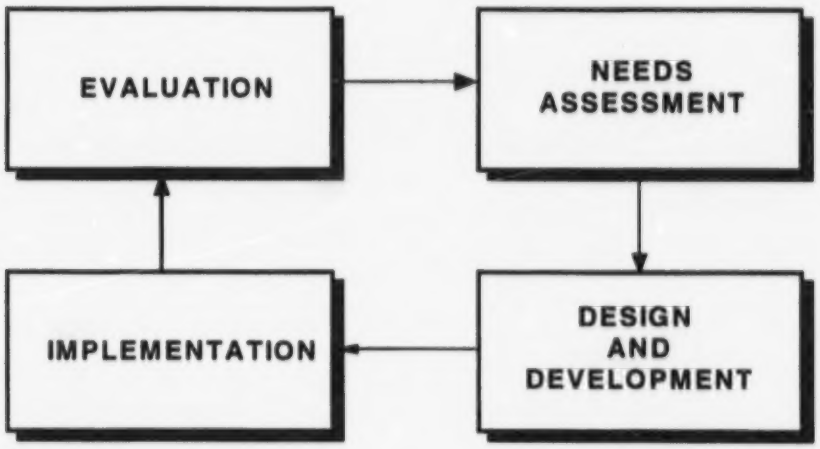

Figure 1. Simplified RAAF Training Cycle

As indicated by figure 1, the cycle is a never ending process which constantly seeks to improve the quality of the training that is provided. The RAAF uses this model as a basis for training design because it encompasses all aspects of the training process.

A complete training process includes not only the instruction that occurs in the classroom or is delivered in a distance education mail package, but includes the extensive development work which takes place long before the subject material is presented to students. The structured process that is followed by the application of a training development model allows the subject matter experts (academics) and the instructional designers to concentrate on the specific details of the course or subject under development. The model used should ensure all aspects of course development are considered.

A structured model upon which to base training development and a thorough understanding of this structured process is a foundation for good instructional design. In turn, good instructional design contributes immeasurably to the development of skilled graduates who can perform satisfactorily on the job. The skilled performance of the graduates is the ultimate goal of the instructional design process.

The simplified model indicated in figure 1 can be expanded into a detailed model which incorporates all of the activities which need to be undertaken in the complete design process. Figure 2 details the complete RAAF Training Cycle and covers the following elements in the training development process:

- Job needs analysis
- Training needs analysis
- Training design strategy
- Task analysis
- Assessment strategy
- Selection of instructional methods
- Instructional media
- Syllabus/curriculum development
- Instructor guides
- Course materials
- Implementation
- Evaluation
- Training management

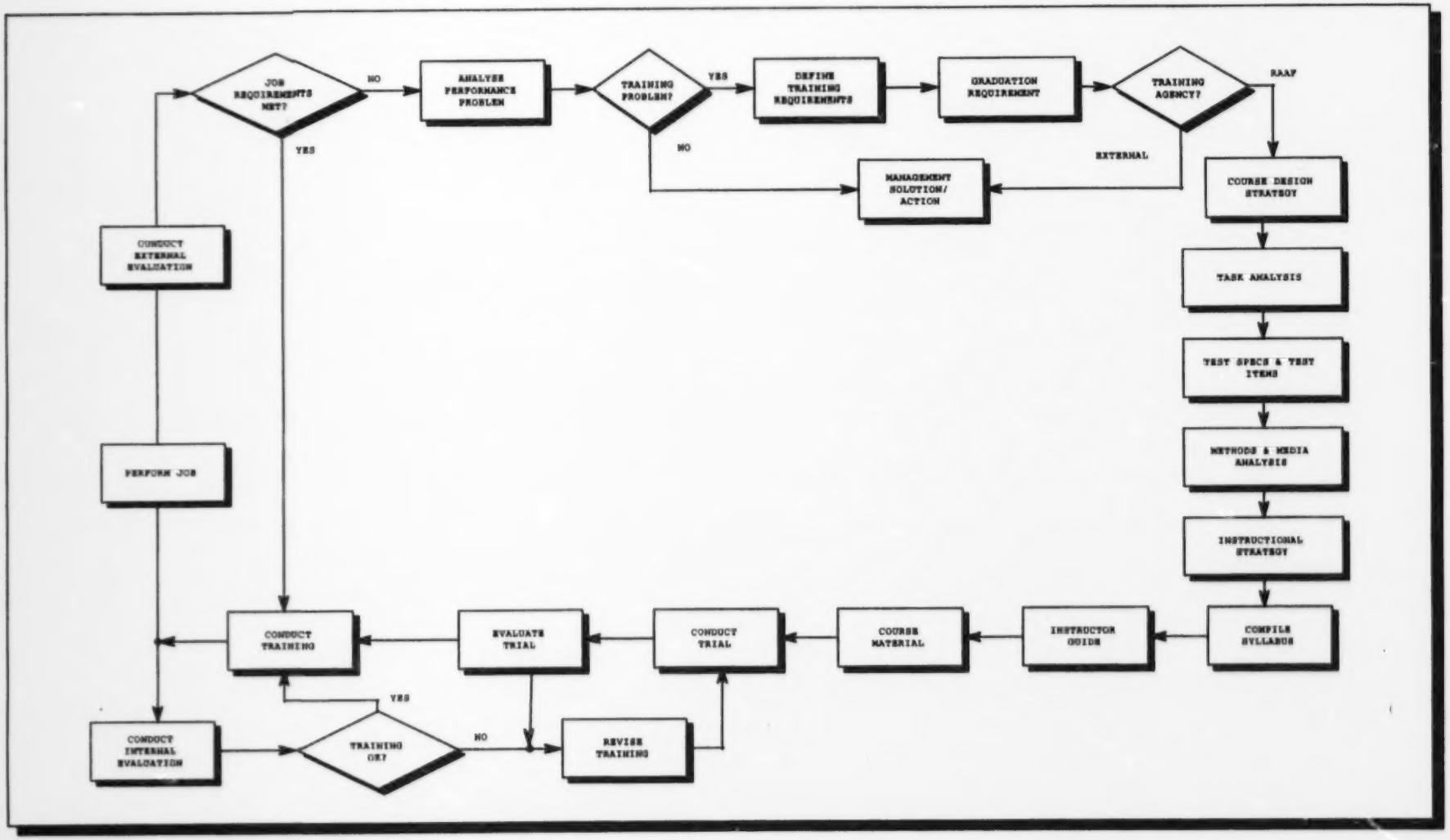

Figure 2. Complete RAAF Training Cycle

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Project management

The magnitude of this project entailed the application of extensive project management principles and skills. Everyone involved in development needed an understanding of individual task responsibilities and an understanding of the relationship of their task to the entire project. This relied on the appreciation by all of the extent of the project and each person's role in this project.

The course ware itself needed to be planned, developed, amended, processed, compiled, managed and distributed. A Style Manual was developed early in the project to provide guidelines for the development of course ware. This manual provided the accepted minimum standard which each designer needed to achieve.

A system of recording subject development status and the development of a storage and backup system for the computer network, accessible by all designers was initiated. All subjects developed were identified by a file numbering system which indicated the subject/module, type of course ware (student notes, instructor guide, exam, etc) and the status. A directory structure was developed which allowed all designers to store files in the correct location. Access rights to files and directories was assigned to individuals in line with their task level and responsibilities. A computer backup system regularly saved (daily) the files stored in these directories. With these systems in place there was minimal loss or corruption of project files.

Staff training

Staff training was an on-going task as each designer had differing levels of ability and understanding of their particular tasks. Nevertheless, training sessions were scheduled throughout the project, usually at the commencement of a different stage of the development cycle. Some staff training occurred within the team whereas other more specialised training was contracted out or provided by other institutions. RAAF training design principles were followed and this project has updated and improved the scope of the RAAF training design system. Much of the training revolved around the following :

- procedures to be followed in the RAAF Training Cycle,
- achievement of the style detailed in the style manual,
- the use of the computer applications,
- use of the computer system.

Gaining acceptance of the new structure

Since this project completely redefined the structure of trade training within the RAAF, there was much resistance to the changes being implemented (especially from the longer term members). This was overcome to some extent by regular information circulation which involved formal information sessions at each RAAF base in Australia and circulation of a newsletter on the progress of the project. Informally,

the idea of change was slowly accepted and these changes were seen as the way for the future.

Liaison and consultation

This project required extensive internal and external consultation. Internally the project was self generating by the teamwork approach which enabled all team members to contribute to the development process (within the requirements allowed). Many other RAAF sources were consulted to ensure the course ware being developed aligned with the real requirements of jobs and workers in the workplace. External agencies were also consulted to align the new courses with accepted standards in the Australian aircraft industry and to ensure the finished courses would provide accreditation for the future graduates.

Global understanding

A vital part of this project was for all designers to have an understanding of the complete Instructional Design process and the extent of the new trade structure. This enabled the course ware to be developed with a perspective of the existing trade structure and the future course directions. Other important aspects needed by each Instructional Designer were:

- the relationship of the subject they were working on to all others in the course
- the effect of changes in course components to other course elements
- the impact of the changes on the future client or customer (instructors or students)
- accreditation issues

Conclusion

This project required a large number of people to work together over a lengthy period towards the same goal. The project is still progressing and is now in the process of developing much of the course ware to be delivered using other instructional media. The adherence to a structured process and identified responsibilities for development, editing and amendment allowed the first phase of the project to be achieved in the time frame allowed.

The project has not been without problems, and initially there was much resistance to the changes that were occurring. However, through dedication and the application of a structured process for instructional design, the courses are now in use at training centres throughout Australia.

In November 1993, the project won an award (High Distinction) from the Australian Institute of Training and Development (Victorian Division) in recognition of a

commitment to excellence in training development. This marked a significant achievement for the project after 3 years in progress.

Many lessons were learnt during this project which could be applied to any organisation which develops and delivers training and education. The following quality issues are suggested for further discussion/exploration at Charles Sturt University:

- Acceptance of change as a natural process in the advancement of course quality
- Acceptance and development of agreed standards fro best practice in DE materials (Style Guides, Procedures Manual and Quality Certification documentation at CSU is helping to achieve this)
- The fostering of a teamwork approach for subject/course development (Peer review and collaborative development of subjects/courses is occurring)